IOWA
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BETTER STREAMS---THE PROBLEM

By George M. Foster
President, John Morrell & Company

EDITOR'S NOTE. More and more Iowans are recognizing the recreational value of our 15,000 miles of streams, and more and more effort is being expended, nationally as well as locally, attempting to correct unfavorable stream conditions often unnecessarily caused by civilized progress. This article on pollution by George M. Foster, President of the John Morrell Packing Company of Ottumwa, is the result of correspondence between Mr. Foster and J. N. Darling, internationally known conservationist and cartoonist. Although some points brought out in the article may be controversial, in the main the "Conservationist" is in agreement with the author.

MOST people realize that our rivers are not what they used to be a hundred years ago but they probably have not given much thought to the question of exactly what are the causes.

A brief look into the subject will indicate that our rivers have been affected in the main by four things: 1) silt carried in suspension, 2) excess variation in flow, 3) pollution from farms, 4) pollution from cities.

Few people have any further contact with the river than to look at it or fish in it, and because silt gives us a stream that is always murky, with mud bottoms and banks, silt is named as one of the greatest offenders.

In respect to variation of flow, history records that there have always been floods and droughts. Unquestionably they are more severe now than they used to be. The prairies are no longer covered with the deep sod of wild grasses which had the capacity to feed an enormous quantity of water down into the subsoil and which would reappear in springs to assist in maintaining a reasonable flow in the streams throughout the summer.

In common practice agriculture has much of the soil either totally exposed, causing a quick runoff and erosion, or else closely cropped

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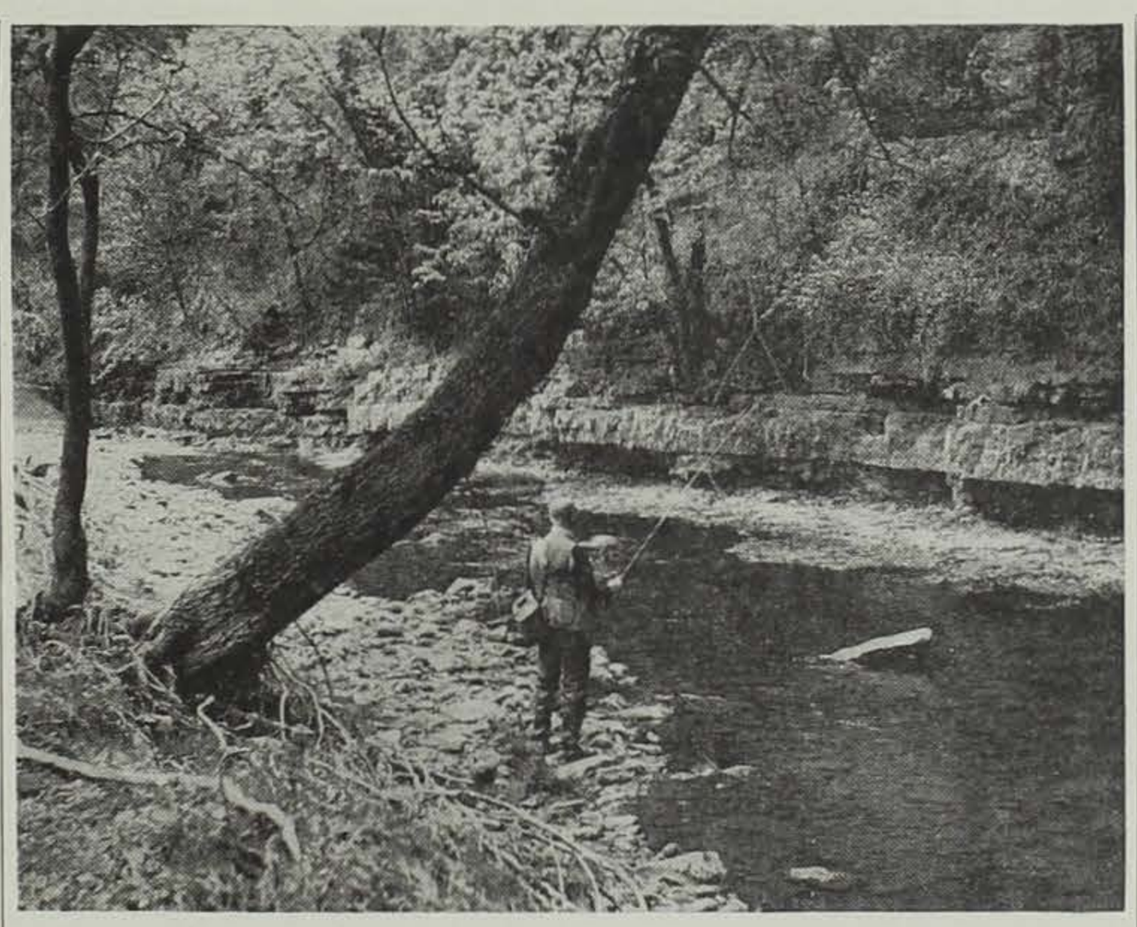

The rocky streams of northeast Iowa are second to none in the United States for beauty. The watersheds for the most part are heavily timbered and lightly grazed, the waters clear and sparkling.—Jim Sherman Photo.

Fact Finding on Spirit Lake Walleyes

By E. T. Rose
Fisheries Biologist

FISHERIES resources are being brought under human control at an ever increasing tempo by the application of research discoveries. Fish management principles which have for many decades been thought sound are now being subjected to thorough scrutiny by unbiased investigators. In many instances their findings and recommendations clash with the accepted theories and management practices. But, just as the atom bomb is the product of science, the data of the fishery scientist, though not so startling, is just as factual and irrefutable.

Practically all phases of fish management, including fish hatcheries, stocking policies, rough fish removal, fish rescue, creel limits, open seasons, etc. are now being questioned and examined carefully.

As part of the Iowa fact-finding program, a study is at present underway to attempt solution of the controversy regarding our walleye pike stocking program. Under this program, adult walleyes are caught in gill-nets at spawning time, stripped of their eggs and the eggs fertilized and hatched in hatcheries. Adults are, of course, returned to the lakes as soon as they are stripped.

The newly hatched fish, or fry, are then stocked back into the lakes. It is contended by many observers that these hatchery fry constitute such a very small per-

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WHAT MAMMAL IS THAT?

By Thomas G. Scott
Iowa Cooperative Wildlife Research Unit
(Part II of two parts)

The Bats

THESE are the mammals in which the fingers of the fore legs are greatly elongated and joined together with the sides of the body by a membrane. This web permits true flight. Although the bats as a group are easy to distinguish from other mammals, the identification of the species is difficult.

In Iowa nine different kinds of bats are now known to occur; others, however, may be found. Two species may be known by the complete furry covering of the upper side of the membrane joining the hind legs and tail. The more common of these, and probably the most common bat in the state, is the red bat. This species may be known by its reddish or yellowish color, with whitish shoulder spots; it is about five inches long and has a wing spread of nearly 11 inches. The other bat in Iowa which has fur completely covering the upper side of the tail membrane is the hoary bat. It is chocolate brown in basic color, overlaid with white. It exceeds five inches in length and has a wing spread of 14 to 16 inches; it is the largest bat thus far found in Iowa. Both these bats, the red and the hoary, prefer to spend daylight hours hanging in the trees. They are migratory and are seen here only in summer.

A bat with the tail membrane sparsely furred on the upper side for about one-half its length may be recognized as the silver-haired bat. As the name indicates, this bat is clothed with

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BOUNTY ON WILD CAT FIRST CLAIM AGAINST BOARD

Payment of a one dollar bounty for a wild cat scalp was the first business of Webster county's board of supervisors following that august body's organization more than three-quarters of a century ago, according to Supervisors' Journal No. 1 unearthed in the dusty vaults beneath the county auditor's office.

How its members were elected and where it met for the first time are facts not revealed in the ancient record, but the first board was composed of a representative from each of the county's townships, numbering eleven at that time.

The records indicate, however, that the duties and responsibilities assumed January 7, 1861, by the first board of supervisors had earlier been the charge of the judge of county court, for in a petition drawn at an early meeting the supervisors asked the barrister to turn over to them all records and account books.

"Pay to John Mayberry, bounty on wild cat scalp, $1.00," is the first of millions of dollars the board has since paid in claims against the county. "Pay to David Snodgrass, bounty on wolf's scalp—$1.00," is the second claim. Where the bobcat and wolf were shot are interesting details regrettably omitted from the records.

—Fort Dodge Messenger

STATE NEEDS TREES

Looking at the entire state of Iowa one can't think of utilizing soil and water resources without waste unless a place is found for trees.

The state's early settlers found almost one-fifth of it covered with timber. Much of this has been cut, some to be used as forest products but much more to make way for cultivation of crops.

This heavy cropping has left thousands of acres of land so eroded, so unproductive it now has little economic value. Yet trees will grow on much of this land.

Whether the area is large or small trees will grow and cover the scars. They will, in time, stop further erosion. In time they will grow into a valuable crop to be harvested for posts, firewood and lumber.

Planting trees on eroded areas is conservation, too. So is planting trees along the streams and in the gullies. It is conservation to plant trees wherever they will protect the land and man and give a greater long-time return than another crop which might be grown.

—Ringsted Dispatch

Eighty-six thousand acres of public shooting grounds are posted with signs to enable hunters to locate them easily. Here is evidence showing that some unknown hunter found the Prairie Lake public shooting grounds.

IOWA PUBLIC SHOOTING GROUNDS

By L. F. Faber
Biologist

IN IOWA most of the land is in private ownership or occupied by tenants who can say yes or no to a hunter seeking some place to hunt. Because of this fact many state-owned areas under the jurisdiction of the Conservation Commission are so managed to provide maximum hunting during open season to anyone holding a hunting license.

This fall sportsmen will have 86 public shooting grounds to choose from. Parts of some of these areas, 2,685 acres in all, are set off as refuges, still leaving 63,085 acres where only the regular hunting laws apply.

All public shooting grounds are posted with 12" x 12" signs with white letters on a green background. Some of the northern areas are also marked with signs indicating the name of the area, the acreage and a request to treat the area in a sportsman-like manner.

At the entrance gate of some of the pheasant areas you will find boxes containing cards on which the hunters are asked to fill in the spaces relative to hours hunted, the bag by species and number, whether or not you use a dog and similar questions. This is an attempt to learn the amount of use of the area, to gather information on hunter take and other data essential to efficient pheasant management. You will also be asked to watch for and report to the Conservation Commission information found on the leg banded birds shot or found dead.

Exact locations of all the public shooting grounds in the state, along with their acreage and the principal games found thereon, may be determined by referring to map number two on the State Conservation Commission's new Outdoor and Highway Map. Sportsmen not having a copy of this map may secure one by writing to the State Conservation Commission, 10th and Mulberry, Des Moines.

HOOKS EVOLVED

Fishing tackle used today is a far cry from the crude but effective implements used by primitive man. From knowledge of the habits of early man, it appears that he first used the spear for taking fish, then the hook and line, and later the net. It is possible that for a time he also used the bow and arrow. The earliest form of the primitive fishhook probably was a small piece of polished stone, grooved in the center, tied to a line in the groove, and covered with bait. When the fish swallowed this lure, the stone turned crosswise in the gullet and the finny member was captured.

Authorities estimate that the stone type of hook was first used about 7000 B. C. Then came the slow transition from stone to bronze wire which, although still tied at the center, was far more flexible. By this arrangement it was possible to bend the ends and to sharpen the points. The result was a double hook which actually penetrated the fish. From the double to the single hook the transition was rapid, as was the introduction of the barb. This type of hook with many variations and made of many kinds of materials such as wood, bone, and flint, had its ultimate end in the modern, tempered steel, barbed hook of world-wide use today.

CATFISH VS. THE FILLET

Since our recent sojourn in Minnesota where the fishing is supposed to be something extra, we have heard much talk among local fishermen of the wonders of catfishing in the creeks of southwestern Iowa. These gentlemen maintain that there is no pleasure in this line quite equal to the catching of a lusty catfish. They ridicule the claims of pike fishermen that the cat is not the fighter that the pike is. They maintain stoutly that a cat will fight as long and as hard as any denizen of the deep of comparable size and when it comes to the eating, these Iowa fishermen go into ecstasies over the gustatorial delights of their favorite victim. Being an Iowan, and not much of a fisherman in any state, we are inclined to agree with the local Izaak Waltons in their claim and to criticize the good old home state for not making more of those muddy Iowa creeks and rivers which seem to give so much pleasure to those who fish along their shady banks. What the Iowa catfish needs is a good press agent and a bit of publicity.

—Atlantic News Telegraph

Some species of octupus have tentacles fifteen feet long and a total spread from tip to tip of over thirty feet.

Loons can dive as far as fifty feet under water.

A monster loggerhead turtle weighing nearly 700 pounds was recently captured alive off the Bahamas Islands.

Better Streams . . .

(Continued from page 65)

pasture which has little water absorbing ability. The quick runoff causes more extreme floods during rainy spells and lower stream levels during drought because of the lack of springs.

Corn is unquestionably responsible for much of this trouble. It is difficult to correct but there are some things that can and should be done. The elimination of plowing on steep slopes, contour plowing on less steep slopes, grassed waterways and protective vegetation on both sides of all creeks as advocated by the soi conservationists will help. Headway will be slow but we must at least try because we cannot give the land back to the Indians.

Items three and four, pollution, are of course, a joint contribution of the barnyard and the city. Litle can be done about the former but much can be done about the latter and should be done to the extent that the benefits justify costs.

To accomplish this we need a careful analysis of every problem and a remedy prescribed to fill the individual needs. I believe that many mistakes have been made in the past in trying to find a solution and I shall attempt to describe why I think we have made them.

Most people look at the elimination of city pollution as a simple proposition of installing a "sewage disposal plant." They think of it as something that comes wrapped in a package, and we buy one size for a city of 25,000, another size for a city of 50,000, and so on. The installation is made, everybody feels satisfied that the situation has been satisfactorily taken care of, and unless they happen to get on the "down wind" side of the treatment plant on a summer evening, they dismiss the subject from their minds.

There are a number of errors in this line of reasoning. The first is that what we think of as a cure is not a "disposal plant," it is just a "treatment plant," and the success and value of the treatment varies through wide limits.

Even when very efficient plant operation is obtained: 1) The water is still murky with suspended silt, and the bottoms and banks are mud. (2) The runoff from the land is as rapid as ever, and the floods and droughts are still with us. 3) A majority of the barnyards in the state still wash off into the rivers. Pollution from this source is exceptionally severe following a heavy rain. 4) Pollution from the city has been reduced by the "treatment plant" to the point where no floating scum is visible, no sludge banks form in the bottom, and odor has been reduced. However, insofar as the water being approved by the Health Department for drinking and swimming, it would have little better chance than before the plant was installed. Furthermore, were we to get the right combination of ice and snow with a low stage of water, fish will still die.

Agriculture at its worst has much of the soil either totally exposed, causing quick runoff and erosion, or else pasture closely cropped with little water absorbing ability. The quick runoff causes more extreme floods during rainy spells, and lower stream levels during drought.

At this point I wish to mention one interesting bit of evidence to support the statement that a so-called "disposal plant" is nothing but a "treatment plant," and the ultimate results of the treatment sometimes are not what we anticipate.

The Des Moines River is the source of the water supply for the city of Ottumwa. The raw river water requires extensive clarification and purification, but with few exceptions results were satisfactory prior to the installation of the sewage treatment plant below the city of Des Moines. Since this plant was placed in operation, heavy masses of green algae, as well as other troublesome varieties of plants, have at times appeared in the river above Ottumwa. Algae, although usually not harmful, produces a disagreeable taste, which is exceedingly costly and difficult to eliminate.

A non-technical explanation for this is that the effluent from the Des Moines plant is more stable than raw sewage, and provides a more perfect medium for the growth of algae.

As a result of this greatly increased algae growth the Ottumwa Water Works, which takes its supply from the river 100 miles downstream, has been forced to spend many thousands of dollars to install final carbon filters to aid in removal of the algae tastes and odors. This additional treatment had not been found necessary until after the installation of the Des Moines Sewage Treatment Plant.

It is surely conclusive proof of the fact that we do not dispose of sewage, we merely treat it, and the treatment to be prescribed depends on each individual situation.

I think that a sane attempt to find a solution, or partial solution to the problem, is to recognize all the elements involved. We must first admit that the offenders, mud, floods, and droughts, are not related to pollution, and they will still be with us. We can do little about pollution from the barnyards, but we can do something to reduce the pollution from the cities. However, it will be impossible by this means to make the river a safe place in which to swim, or fit for drinking. With these limitations in mind, let us do what we can to maintain the esthetic beauty of our streams and protect fish life.

I believe that the legislature should authorize a scientific fact-finding commission of qualified men to which major issues on water resources might be referred. The commission might include the following: the head of the Geological Department of the State University of Iowa, an expert biologist from the staff of the Iowa State College at Ames, a biochemist from one of the colleges in the state, the Secretary of Agriculture, a representative of industry, the Department of Health and the State Conservation Commission.

Such a commission should be non-salaried but provided with an expense account and authorized to employ such technically qualified experts as might be required to thoroughly analyze and furnish reliable data on any question of water resources management which might arise and make recommendations thereon.

Among the first objectives of such a commission would be to set up a yardstick of stream and lake management to preserve the esthetic and scenic values, to protect public health, fish, and wildlife and to restore, as far as possible, the beneficial attributes of our water resources. These standards should provide, among other things: 1) disposal of organic wastes, so that the bio-chemical oxygen demand in any cross section of the stream should not be so great as to destroy fish life, 2) prevent the discharge of settleable solids from industrial waste and domestic sewage into streams, 3) prevent the discharge into streams of any chemical poisons.

The commission, in addition to setting these standards, should study the effect of flood control dams, hydroelectric power dams, extensive drainage projects, ground water tables, stream flow, and furnish basic data necessary for decision on the value or harmful consequences to the state as a whole on all water use.

I further believe that the commission should be empowered to employ a recognized sanitary engineer, to assist it in carrying out its duties and in the interpretation of technical data.

I make these suggestions based upon a careful survey of the domestic and industrial waste that is now being emptied into the river at Ottumwa, and I am convinced that the standards which I have defined are such as to remove the objections of conservationists.

I should be very pleased to cooperate with any group in an effort to get legislation of this nature in our statutes.

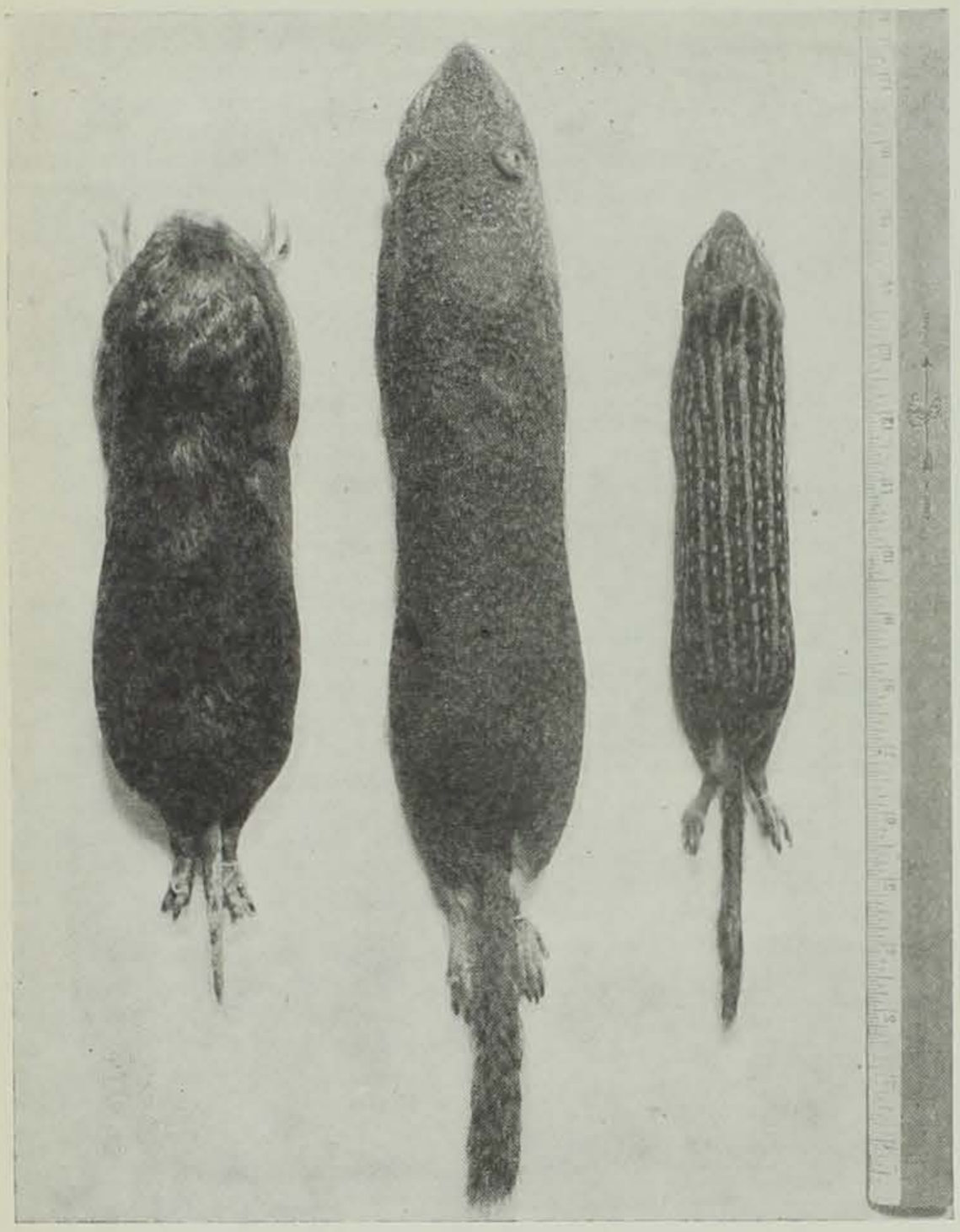
The older a feller gits the faster the time goes, exceptin' of course the time between the duck season an' the fishin' season.

A feller kin injoy a real pleasant afternoon fishin' in a pool thet aint got nothin' in it but ol' ortermobile tires an' broken down gasoline stoves, pervided he don't know it.

Another reason why the old times were the best: a feller could git so excited that he'd shoot his ram rod into a flock o' ducks, then when it came down it'd have three or four ducks strung on it, an' all he had to do was to pick it up an' carry it home.

Accordin' to the duck hunters' code o' ethics, a feller aint even supposed to look at a dead duck again after he's brought him in an' laid him down in the blind, let alone talkin' about 'im.

Next to a big stack o' griddle cakes with bacon, an' sorghum molasses, they aint nothin' that brings back them good ol' duck huntin' camps you used to have like the smell o' a wet dog.



Left to right: Pocket gopher, Franklin ground squirrel, and thirteen-striped ground squirrel.—Tom Scott Photo.

What Mammal . . .

(Continued from page 65)

silvery white-tipped hair. It is about four inches long.

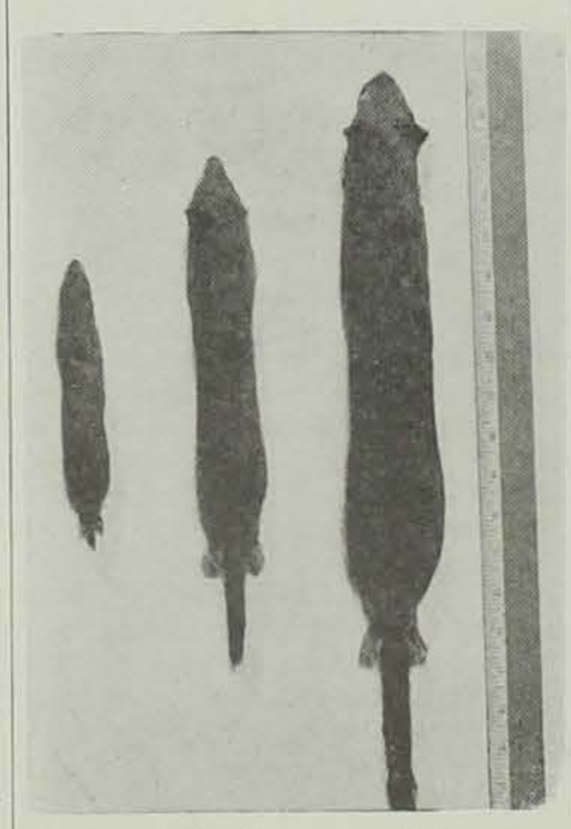
All other Iowa bats have a tail membrane that is totally bare of fur or furred only at the extreme base. Of these, the free-tailed bat may be known by the fact that its tail projects for half its length beyond the tail membrane. This bat is uncommon in Iowa and is usually found in the southern half of the state.

With the exception of the big brown bat, other bats which occur here are small brownish-colored bats that are difficult to identify except from skull characteristics. They are: little brown bat, Georgian bat, Say's bat, and Trouessart's bat. The big brown bat may be known by its relatively larger size; it is about four and one-half inches long. The Georgian bat is known to occur only along the eastern edge of the state, and of the others the little brown bat is the one most commonly seen.

The Flesh-eaters

In spite of the name, some of these mammals do not subsist entirely or even to a great extent on flesh. For example, about 75 per cent of the raccoon's food is of plant origin, whereas only 25 per cent is of animal. In view of these findings, it is interesting to note that the cheek or molar teeth of a raccoon have flat crowns of the crushing type usually present in mammals that derive much of their food from plants. All other present-day Iowa flesh-eaters have cheek teeth with crowns of the cutting type.

Among the flesh-eaters in Iowa are three kinds of weasels, the Bonaparte's weasel, long-tailed weasel, and the least weasel. They may most readily be distinguished by measurements, especially by the length of the tail. In identifying them it should be remembered that the females of weasels are smaller (usually about two-thirds the size of the males). As would be expected, the long-tailed weasel has the longest tail; it is about one-third the total length or five to six inches in both sexes. This weasel is found throughout the state. Bonaparte's weasel occurs only in the northern one-fourth of the state; its tail is not more than three and one-half inches, averaging about three inches for both sexes. The least weasel is found throughout the state; however, it is not frequently caught and then is usually mistaken for the young of a larger species. The tail of this small weasel is about one-eighth the total length, measuring about one inch.



Left to right: Least weasel, Bonaparte weasel, long-tailed weasel. Note difference in body size and length of tail.—Tom Scott Photo.

There is scarcely any need of discussing the identity of the mink as it is so well-known. The skunks are of two kinds: the striped skunk and the spotted skunk or civet. The spotted skunk is the smaller and may be further known by its spotted appearance.

The badger is a larger carnivore with something of the general outline of a woodchuck. It may weigh as much as 20 pounds. The legs are short and powerful. The long claws on the front feet make it a formidable fighter and a strong digger. It has recently extended its range to include all of the state.

The red fox is readily recognized though few have seen it in the wild. It is found throughout the state. The gray fox is found over the eastern part of the state and may be known by its smaller size and salt and pepper coloration.

The coyote may occur anywhere in the state. The coyote is sometimes called "wolf," and in this way mistakes as to identity are made. There is no authentic record of the timber wolf in Iowa. These two wild dogs may be distinguished by weight; the coyote scales to 40 pounds, and the timber wolf from 60 to 100 pounds.

The Rodents

This group of Iowa mammals contains numerous members. The woodchuck or ground hog is found throughout the state and scarcely requires description. There are two ground squirrels: the Franklin's or gray ground squirrel and the thirteen-striped ground squirrel. Both are found throughout the state, the thirteen-striped being the more numerous, especially to the northwest. This mammal has a conspicuously striped and spotted color pattern of a yellowish-brown tone. Franklin's ground squirrel is not striped and has an iron-gray pepper and salt color. It is more secretive in its habits and less numerous than the thirteen-striped ground squirrel and hence is not so frequently seen.

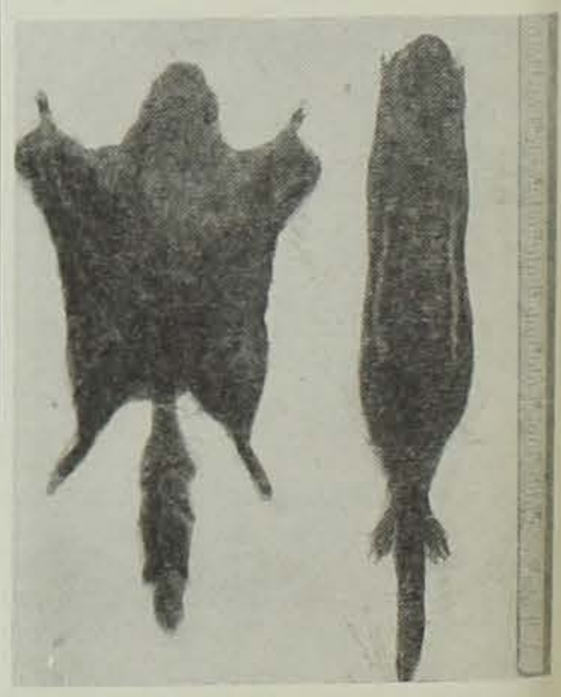
The chipmunk is of scattered occurrence in wooded areas throughout the state. It is a small reddish-brown squirrel with five blackish stripes arranged on the back as follows: a middle stripe from between the ears to the base of the tail, on each side is a narrow brownish stripe, then on each side are two blackish stripes separated by a light-colored stripe. In behavior it is alert and lively. It spends most of its time on the ground but occasionally climbs trees.

The tree squirrels found in Iowa are: the fox squirrel (sometimes erroneously called red squirrel because of its reddish color), a gray squirrel, and the true red squirrel. The most common of these is the fox squirrel. It is also the largest, attaining a length of about 21 inches from nose to the tip of the tail. The gray squirrel, with a liking for dense woods, is somewhat irregular in distribution and is most common along the eastern edge of the state. It is a large grayish-colored squirrel with whitish underparts: it is about 20 inches in length. The red squirrel is a smaller species (not more than 14 inches in length) with relatively longer ears and of a rusty red color from the top of the head to the tail. This squirrel is erratic in occurrence.

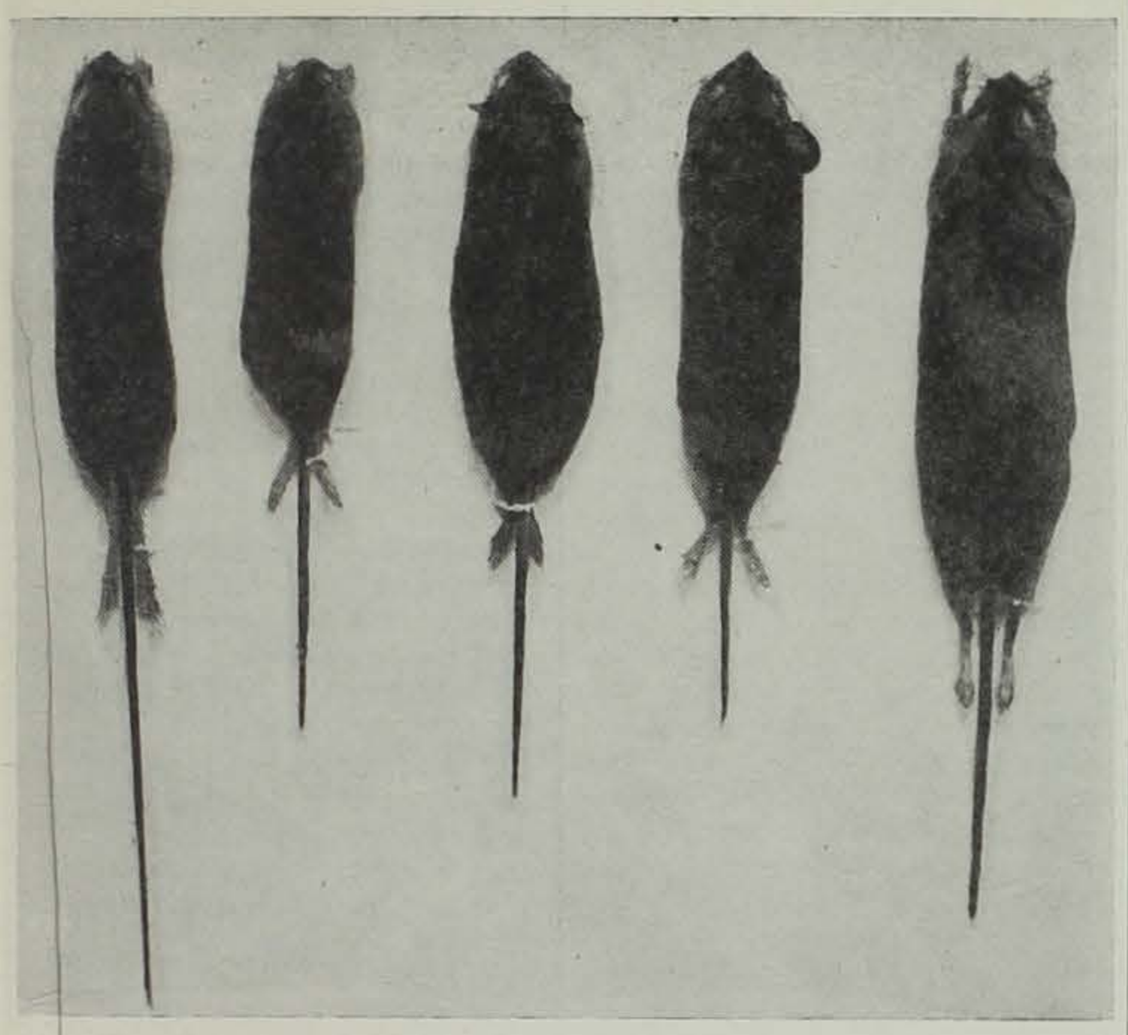
One of the most interesting mammals is the flying squirrel. It has soft velvety fur, gray above and silvery white below. There is a fold of skin along each side of the animal from wrist to ankle. By means of this the animal is able to glide but not fly. The flying squirrel is nocturnal in its habits and for this reason may escape being seen.

One of the most common rodents, known from the mounds of earth it heaves above the surface, is the pocket gopher. In total length it is usually less than 12 inches. The coloring on the upper parts is dark brown; the under parts are light in color. There is a groove along the length of the upper front teeth.

Perhaps the least known of all



Left to right: flying squirrel, chipmunk. —Tom Scott Photo.



The long-tailed mice, left to right: Prairie jumping mouse, prairie harvest mouse, house mouse, Baird white-footed mouse, and northern white-footed mouse.—Tom Scott Photo.

mammals are the various kinds of mice. It is often amazing to see what may be caught in a line of small mouse traps along a fence row. In Iowa it is possible to capture 11 kinds. For our purposes these may be divided into those with short, and those with long tails.

Six kinds of mice have tails greater than one-third the total length. The most common of these are the northern white-footed mouse, and the Baird's white-footed mouse. They are brownish above and white underneath. The northern white-footed may be distinguished from Baird's white-footed mouse by the larger size and the absence of a strong bicolored pattern on the longer tail. The young of both these mice are gray instead of brown and hence are sometimes confused with other mice. Like the white-footed mice the house mouse has a long tail; however, the tail is but sparsely haired and is scaly. The house mouse is brown above and only slightly lighter below. In all these species the face of the upper front teeth is smooth.

Other mice with long tails have grooves running the length of the face of the upper front teeth. Such a mouse with a tail longer than the body and greatly elongated hind legs is the jumping mouse. It is yellowish brown above and white underneath. Another mouse with grooved teeth, and grayish brown above and lighter below, with a tail not longer than the length of the body, is the harvest mouse. The pocket mouse may be known from all the others by the presence of fur-lined cheek pouches. It is brownish-black above to yellowish brown on the sides and under parts.

Of the mice with short tails, the meadow mice are most common. The tail in these mice is not noticeably longer than the extended hind feet, the body in adults is more than five and one-half inches, and the tail more than one inch in length. There are two kinds of meadow mice, the prairie meadow mouse and the Pennsylvania meadow mouse. These are difficult to distinguish in the field, but the prairie meadow mouse—usually taken in well-drained areas—shows a buffy or cinnamon color underneath and five pads of tubercles on the hind feet. On the other hand, the Pennsylvania meadow mouse—usually caught in poorly drained areas—is grayish underneath and has six tubercles on the soles of the hind feet. A short-tailed mouse taken in southern Iowa having a total length of less than five and one-half inches, a tail one inch or less in length, upper parts dull brown and under parts gray tinged with cinnamon brown, would be a pine mouse. A short-tailed mouse with a tail about as long as the extended hind feet and a deep groove along the outer edge of the face of the upper front teeth, would be Goss' lemming mouse. A mouse with a short tail about one-third the total length and fairly large ears, may be taken in the extreme northwest part of the state. This is the grasshopper mouse. Other rodents such as the muskrat, beaver, and Norway or barn rat are well-known.

The Rabbits

These are usually considered with the rodents, but there is good reason for placing them in a separate order. The rodents have but two upper incisors or front teeth, whereas the rabbits have four. There is a large functional pair of teeth in front, and concealed immediately behind these is a small pair, easily overlooked.

Only two kinds of rabbits occur in the state: Mearns' cottontail and the white-tailed jack rabbit. The jack rabbit was originally found only in the northwestern part of the state, but it has gradually extended its range throughout Iowa. The cottontail also occurs in all parts of the state, but it is most numerous to the southward.

The Deer

The deer in Iowa are represented by one species, the white-tailed deer. This deer was formerly found throughout the wooded parts of the state. Great numbers of them were utilized by the early settlers for food and clothing. Galland writes of southeastern Iowa in 1840 that hundreds were killed annually.

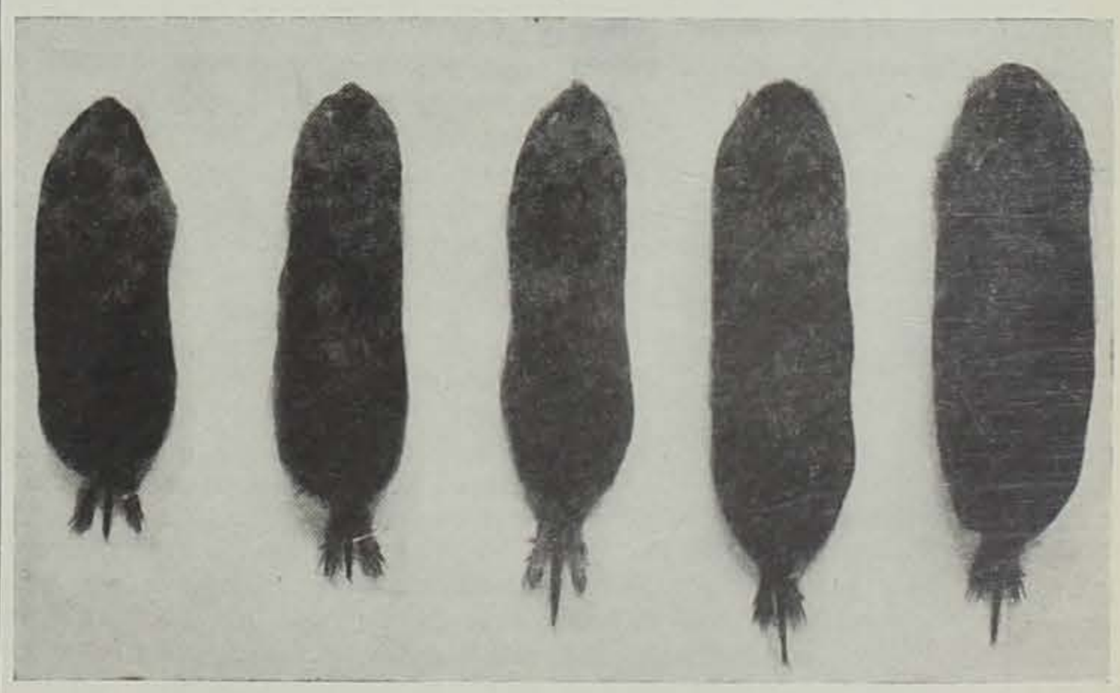
The effect of civilization on the deer population was seen earliest in the eastern part of the state. Fultz reported deer last seen in Muscatine County about 1851. The greatest deer slaughter in Iowa occurred after the blizzard of 1856. A description of the occasion is given by Brainard (Annals of Iowa, 1894, p. 393), who wrote: "Another lamentable effect of the ice-cap of that winter was the cruel and wanton destruction of wild game. Prior to that season the groves bordering the streams in northern Iowa were well stocked with deer, elk, hare, foxes, wolves, etc. The ice drove these out from sheltering timber to seek food about the farmers' stacks. Men and boys with dogs and guns made savage onslaught upon these. The sharp feet of the larger game cut through the ice and rendered their escape impossible. In some instances they were run down by men on foot, with no other weapon than the family butcher knife, which was all too effective."

In 1856, the Sixth General Assembly passed the first law for the protection of deer, providing a closed season from February 1 to July 15. The numbers of deer may have increased under protection, for in 1868 the 12th General Assembly extended the open season by one month. Deer were considered more or less common in southwest Iowa during the summer of 1867. The closed season on deer was again lengthened by the 14th General Assembly in 1872. V. E. Harris of Glenwood reported that his uncle, C. G. Johnson, killed a deer four miles southeast of McPaul, Fremont County, in September, 1881, and that the event was considered unusual because deer were thought to have been exterminated in the county. There were reports of a few of the animals remaining in Dickinson County in 1882. One was killed in Sac County in 1890. Complete protection was given deer by action of the 27th General Assembly in 1898.

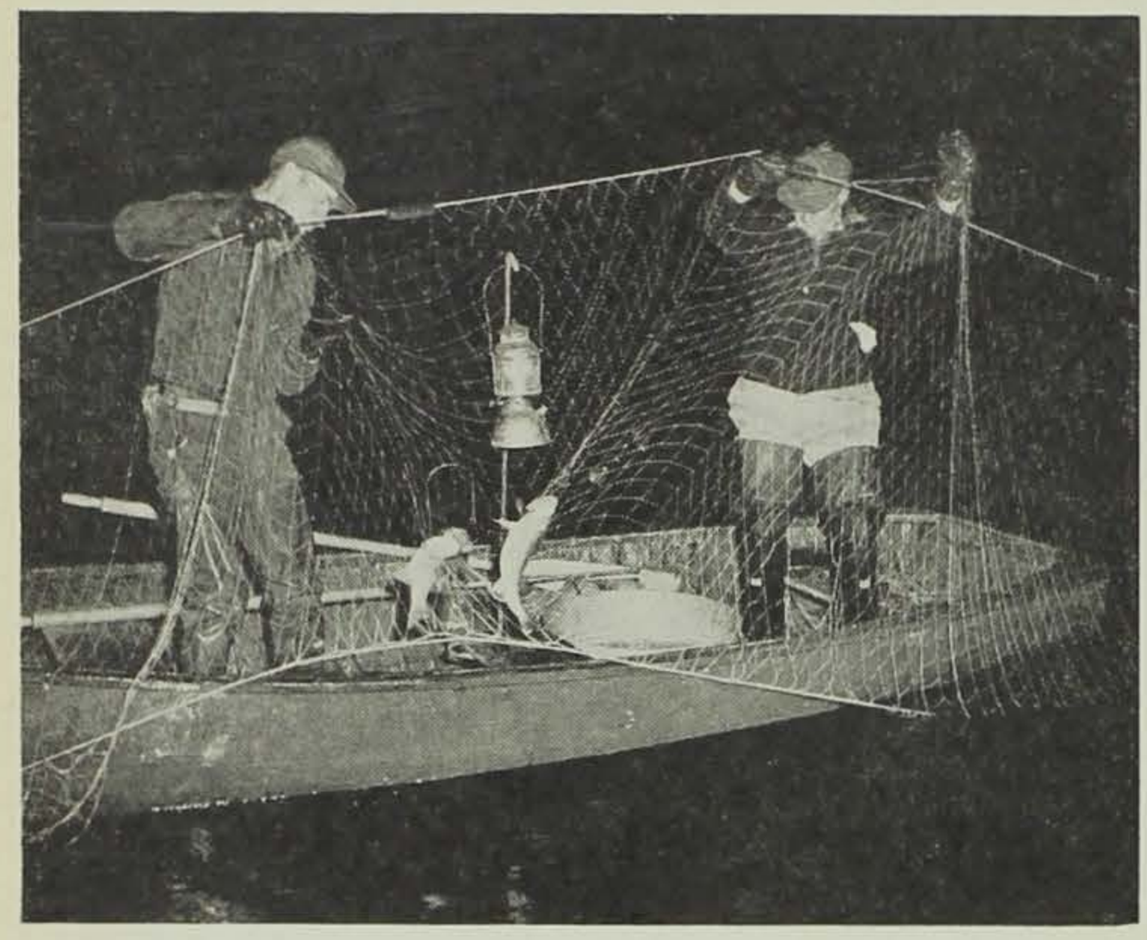
Escapes from three herds of captive deer are responsible for the reestablishment of this mammal in Iowa. William B. Cuppy, of Avoca, Pottawattamie County, possessed one of these herds. Hon. Frank Beymer, editor of the Avoca Journal-Herald, informed the writer that Cuppy purchased his deer somewhere in Nebraska. One night in 1894 the gate to the deer park was opened and all the deer escaped to the timber on Cuppy's farm. At that time there were 35 in the herd. Twelve years later, during a drive, Beymer estimated their number at 200. A second herd at the Ledges State Park descends from deer formerly kept at the game farm of the old Fish and Game Commission. A third herd is located near Keota, Washington County. These deer are known as the Singmaster herd and represent escaped animals which were also probably purchased in Nebraska.

Deer from the three herds discussed have been planted in various parts of the state, and other animals have wandered in from surrounding states. In recent years deer have been reported

(Continued on page 71)



The short-tailed mice, left to right: Goss lemming mouse, woodland pine mouse, short-eared grasshopper mouse, Pennsylvania meadow mouse and prairie meadow mouse.—Tom Scott Photo.



Hatchery employees, while gill netting for brood fish, are beginning to recover some of the first fin-clipped walleyes. Data on these marked fish is noted and the experimental specimens returned to the lake where they may be netted again in succeeding years or may be taken later by anglers.—Jim Sherman Photo.

Fact Finding . . .

(Continued from page 65)

centage of the naturally reproduced fish that it is a waste of time and effort to produce them.

Others contend that due to the extremely high losses incurred by predation and the elements, that the percentage of survival to maturity is too low to justify the program.

Consider for a moment the following bit of "paper-fish," which is constantly being held before the fisheries investigators. Suppose we have a lake about the size of Spirit Lake, say 5,000 acres, and in it, among the 30 or so other species of fish, we have 25,000 adult female walleyed pike. This would be on the average of about five adult female pike per acre, which we will say is not unreasonable to contend.

Through our hatchery records we find that on a good average year 600 quarts of eggs are taken from 2,000 female pike. Now then, how many fry will these 25,000 adult walleyes produce by natural reproduction? We know that 2,000 adult females will produce about 600 quarts of eggs. There are 150,000 eggs in one quart. There we have the simple proportion 25,000 is to 2,000 as X is to 600. Or X equals 1,125,000,000 eggs from the 25,000 females. We know that naturally spawned eggs are highly infertile. We will therefore permit a one per cent hatch from the one billion, one hundred and twenty-five million eggs, and we will still have 11,250,000 fry in the lake. If one per cent of these survive to reach maturity we will have 112,500 catchable fish produced in about three years from this year's hatch.

We all know, of course, that there is nowhere near this number of fish reaching maturity every year. The Iowa department feels that the greatest loss occurs from the time the eggs hatch until fingerling (four to six inch) size is reached.

In order to partially overcome these losses the commission has adopted a policy of raising as many pike as possible from fry to fingerling size in nursery ponds. In fact, Iowa has pioneered in this phase of fish culture, having attained a high degree of success with the species. Now the question has been raised—how do we know these fingerling survive and that they, too, are not being utilized as forage by other large predacious species in the lake? If they do survive, what percentage ever enters into the catches of pike? These are good questions for which we must obtain the answers if we expect to justify the program.

Some states question the value of additional stocking of fish when the species is already present in the body of water except to balance fish populations. They contend that if environmental conditions are suitable for a particular species of fish, it will thrive. Furthermore, additional stocking will aggravate and increase competition for available food supplies.

In view of the logic in these questions and the obligation to the sportsmen to provide adequate walleye fishing, the commission has initiated a method of finding out the facts regarding the value of stocking walleyes. When the study is completed answers will be available that have been long desired by the fish-management profession.

The plan operates as follows: Walleyed pike of fingerling size (four to six inch) are permanently marked by fin-clipping before being stocked in the lake. In this procedure, either a pectoral or pelvic fin is removed by shearing off close to the body. The process is not painful, does not impair its ability in any way, and is a permanent mark. Through examination of the catch in the gill-nets during hatchery operations in the spring, and the fishermen's catch on Spirit Lake, some information is already coming in which tends to show considerable survival of the stocked fingerlings.

Since no fry have been stocked in Spirit Lake for the past several years from the hatchery, all walleyes caught must be either naturally spawned or reared to fingerling size in nurseries, fin-clipped and then stocked in the lake. **In the evaluation of results it is, of course, desirable that every effort be made to obtain a record on all fin-clipped pike that are caught and removed from the lake. Consequently fishermen are urged to report to the commission any pike caught which has one of its fins missing. The length, weight, date caught, and the fin-missing should be reported for the records.**

To date there have been 40,377 fin-clipped walleyes stocked in Spirit Lake. In 1941, 6,314 were marked by clipping the left pectoral fin. In 1944, 12,145 were stocked having the right pectoral fin removed. Last fall (1945), 9,973 were stocked minus their right ventral fin. This fall (1946), the left ventral will be clipped from the fingerlings before stocking in Spirit Lake.

By comparison of catches by fishermen and the gill-netted pike for the hatchery, an evaluation of the results can be made. Since the program requires that all pike stocked in Spirit Lake shall be fin-clipped fingerlings, the proportion of fin-clipped and unmarked fish will be therefore a direct indication of the value and survival of stocked pike.

The Conservation Commission does not contend that stocking of hatchery fish is the secret to good fishing; however, it does believe that augmenting natural reproduction is desirable, especially in lakes similar to Spirit.

These lakes have 25 to 30 species of fish all striving for existence, and due to the cyclic tendencies of fish, it is believed annual crops are assured by yearly stocking.

Every species of fish in any body of water exists at the expense of some other species; consequently, to enable dominance of a desired species every effort should be made to insure annual crops of these species. This can be done by sound management practices such as adequate rough fish control, keeping other species of game fish in their proper proportions by altering creel limits and seasons, and, if necessary, by adequate annual stocking.

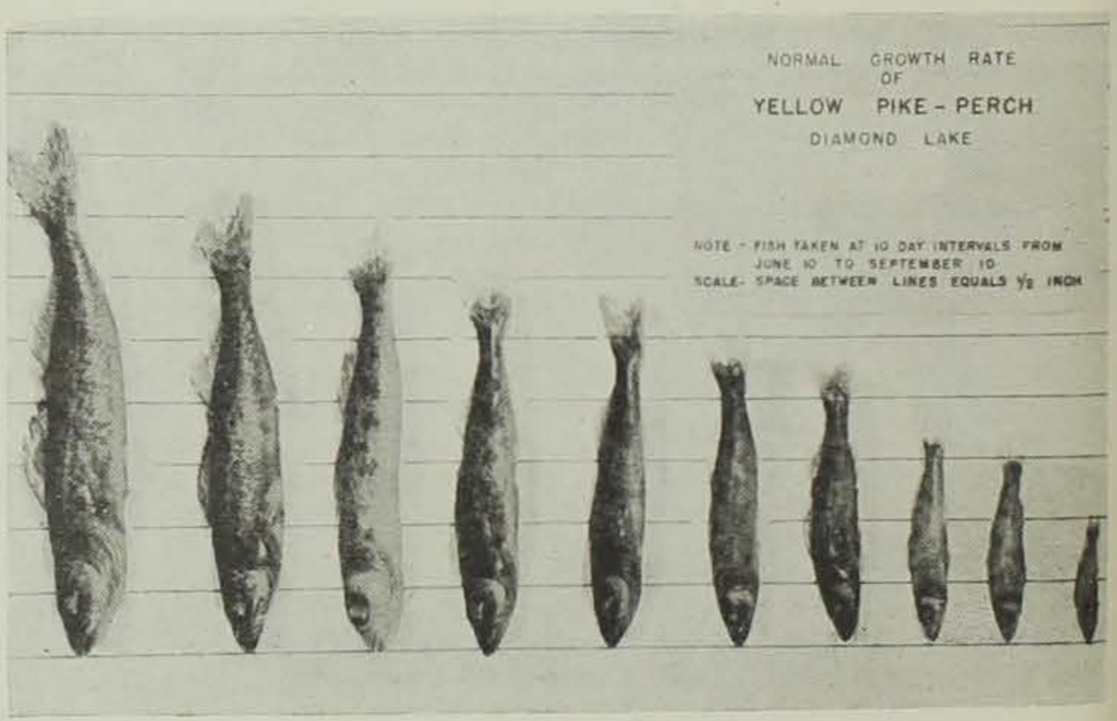
In conjunction with this study, the commission is also operating an intensive creel census. With but few exceptions, the boat livery operators on Spirit Lake have cooperated fully in collecting accurate data on catches of pike and other species.

A lake survey conducted by the commission indicates the relative abundance and species reproduced each year. Thus an integration of these projects yields a fairly complete analysis of population trends, growth rates, food potentials, and whether or not stocked fingerling pike are contributing to the catches. It is necessarily a long-term study; however, if an adequate proportion of stocked pike are not recovered the commission may well consider the abolishment of stocking in certain lakes and devote these funds towards other approaches to better fishing.

In this study we must bear in mind these facts:

1. Little, if any, effort is made to stock yellow-perch, bullheads, white bass (silver bass) and crappie in Spirit Lake, yet, these species dominate the catches of the lake.

2. Lake surveys show definitely a high rate of reproduction in the above species. For example, as



The study of any animal that lives its entire life under water is difficult to say the least, and modern science is only beginning to apply its complicated procedures in the study of fishes. Here is a growth study of walleyed pike showing a gain of an inch a month in a scientifically managed nursery lake.

many as 180,000 fingerling perch per haul (with 500 feet of test seining) were taken in 1944 at one station. How insignificant an additional stocking of 5,000 to 10,000 fingerling perch would have been.

3. Lake surveys definitely prove a relatively low rate of reproduction in Spirit Lake for the walleye pike. Since no fry are stocked, all immature of this species must be naturally spawned. If 25 or 30 fingerling pike per haul (500 foot seine) are obtained it is considered high.

4. Factors limiting natural reproduction must receive further investigation, and the environment adjusted accordingly.

5. Lakes stocked with fry have a much higher population of young-of-the-year walleyes than Sprit Lake according to the lakes surveys, which would indicate the value of fry stocking in some lakes at least.

6 A tremendous amount of study and evaluation of research must be made prior to any justifiable termination of hatchery operations for the walleyed pike.

As evidenced by the presence of fin-clipped walleyes in the catches on Spirit Lake, it would appear that fingerling stocking is desirable. Since the study will require several years more intensive work, no positive conclusions can be drawn at this time.

It is urged that the fishermen who have found such excellent walleye fishing on Spirit Lake this year will continue to examine their catches for these fin-clipped pike, reporting the catch to the hatchery located at the south side of the lake. If possible bring the fish to the hatchery for examination.

What Mammal . . .

(Continued on page 69)

from nearly every county in the state.

Many facts concerning Iowa mammals have not been discussed. It is hoped, however, that the presentation has provided some idea as to the classification of Iowa mammals, the numbers and names of the different kinds, and, above all, an interest in learning more about them.

Beavers like humans are subject to air sickness, so reports Al Reese, Warden-Pilot for the California Division of Fish and Game.

Reese reports that on a recent plant of beavers into the inaccessible back country that three of the five beavers he was moving to a new location appeared to be quite affected by their new mode of travel but soon returned to normal after arrival at their home.

The census of wildlife in this country is incomplete. The census takers skipped the night spots.
—Decorah Public Opinion

The Pacific ocean sunfish often reaches a weight of two tons.

Every shooter should practice gun handling until the gun seems to become a natural part of the body. Then, and only then, shooting and hitting the target becomes comparatively easy.

SHOOT WITH BOTH EYES OPEN

By Frank J. Kahrs
Remington Arms Company

TWO eyes are better than one in any form of shooting. Whether it be shooting at game in the field or at still or moving targets, the beginner should start out by learning to shoot with both eyes open. This will enable him to get a clearer "sight picture" much quicker and improve his chances to score a clean hit.

It is only natural for the beginner, when he places the gun butt to his shoulder, to sight down the barrel with one eye closed. With a little practice, however, he will soon realize that it is much better to keep both eyes open and thus relieve himself of the unnecessary strain of squinting or closing one eye. The shooter uses only one eye in aligning his sights anyway, and that eye is his "master eye."

Every one has a "master eye" and the other is merely an auxiliary. This can be proved simply by pointing your finger at some object on the wall with both eyes open. Then close one eye at a time. You will find that one eye will retain the sighting alignment along the finger, while the finger seems to jump off the target when the other eye is used exclusively. When both eyes are opened, the experimenter will find that the finger is still pointing at the target. The eye which retains the sighting alignment is the "master eye." The domination of sighting by the "master eye" when both eyes are open is called "sight accommodation."

Do the same thing with the gun. With both eyes open point the barrel at an object. If you are right-handed, close your left eye as your right eye will generally be your "master eye." The gun will still be aligned on the object. Now open your left eye and close the right. The barrel will seem to be pointing several inches to the right of the object.

The great majority of expert riflemen shoot with both eyes open. This is particularly true when open sights are used. When peep sights are used, one eye is often closed until the sights are properly aligned and then opened. This greatly reduces eye-strain. In shooting with a telescope sight, a considerably lower percentage of experts shoot with both eyes open, but many of them wear a patch over the "extra" eye to ease the strain of keeping it closed and some have tabs placed on the rear of the sight so that the eye which is snugged up close to the aperture is not interfered with.

In field shooting at moving game with a telescope sight it is best to keep both eyes open when bringing the rifle up to alignment. In this way the shooter does not lose sight of the target or game and does not experience difficulty and valuable loss of time in finding the target as quickly as possible and this can best be done by keeping both eyes open.

Practically all expert pistol shots shoot with both eyes open. After all, shooting a pistol is just like pointing your finger and a natural and comfortable stance always makes for better marksmanship in any kind of shooting.

Many expert pistol and rifle shots have trained themselves to shoot with one eye closed and if they are making good scores consistently with this method, it is not recommended that they switch over to two-eye or binocular shooting at once. But this type of shooting is to be encouraged always and in the vast majority of cases an improvement in marksmanship will soon be noted.

The best shotgun shots, whether it be at game or clay targets, always shoot with both eyes open. The scatter-gun artist seldom sees his sights, or, in many cases, even his gun barrel. His eyes are constantly on the target or game, and he trains himself to instinctively swing the gun in perfect alignment. When the shooter learns to make the gun a part of himself, shooting becomes comparatively easy. When he learns to lead flying or moving targets properly, he approaches perfection.

Every shooter should practice gun-handling until the gun seems to become a natural part of the body. Some shooters seem to almost tie themselves into a knot when shooting at moving targets. They are constantly "working on" their guns instead of making the gun work for them. Many build up mental obstacles which are reflected in their scores, but the fellows who really bring home the bacon are the ones who put into actual practice the old slogan of "Easy Does It." The fact that everyone can always see better with both eyes open needs mentioning only as further proof that shooting with both eyes open maintains the natural balance of vision. You can't hit 'em unless you can see 'em!

MOTTO FOR A DOGHOUSE

I love this little house because
It offers, after dark,
A pause for rest, a rest for paws,
A place to moor my bark.
—Arthur Guiterman

This year the United States Fish and Wildlife Service is asking waterfowlers to keep an accurate tally of birds bagged, crippled, and observed and relay the information on to them at the end of the season. Will you help?

HOW ABOUT IT?

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Chicago, Illinois

Editor, Iowa Conservationist,
10th and Mulberry,
Des Moines, Iowa

You are well aware, I am sure, that every recent indication points to critical years ahead for our ducks and geese. We in the Fish and Wildlife Service very much feel the need for maintaining closest possible contact with gunners in keeping check on waterfowl numbers.

That is why we have worked out the attached form with the hope that you may find space for it in at least two issues of the Iowa Conservationist this fall.

We realize this is asking a big favor, but we know of no better way to reach out to the high grade sportsman and to ask him for this purely voluntary report on waterfowl conditions as he—the actual duck hunter—sees them.

The Iowa Conservationist is in a position to make a valuable contribution to the cause, and we hope that you will be able to go along with us in what seems to be an interesting, worthwhile experiment.

Results of this unique survey fostered by outdoor and state conservation magazines will, of course, be furnished you at the earliest possible time.

Sincerely yours,
(Signed) Albert M. Day
Director

DUCK HUNTERS!

The United States Fish and Wildlife Service invites you to join them on a big job. It needs plain, honest facts. It wants to know what you—the man in the blind with the gun—find out about ducks and geese during the present hunting season. The Service wants reports—purely voluntary reports—on results of your shooting. It wants your views on the waterfowl situation to help it work out fair regulations.

Here's how YOU can help:

1. Keep tally of the birds you bag, cripple, and observe this fall.
2. At the end of the season, send completed score card to the United States Fish and Wildlife Service, Chicago 54, Illinois.

SCORECARD

How Many, What Kinds of Ducks Bagged	How Many Cripples Lost	Compared With Last Year Waterfowl Numbers Seen Were		
		More	Less	Same

SHOOTING GROUNDS (Check One)

Public Lakes and Streams	Commercial Hunting Clubs	Private Hunting Clubs

Where you hunted _____ How many days _____
State County

Comments: _____

_____

Name _____

Date _____ Address _____